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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number 10/707,744

Filing Date January 8, 2004

First Named Inventor Sugar et al.

Art Unit 2685

Examiner Name Not Yet Known

Attorney Docket Number COG-2-0977.02.US

ENCLOSURES (Check all that apply)

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name VOLPE AND KOENIG, P.C.

Signature

Printed name Anthony L. Venezia

Date September 15, 2006

Reg. No. 48,382

CERTIFICATE OF TRANSMISSION/MAILING

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Date September 15, 2006

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:

Sugar et al.

Application No.: 10/707,744

Confirmation No.: 1743

Filed: January 8, 2004

For: MULTIPLE-INPUT MULTIPLE-
OUTPUT RADIO TRANSCEIVER

Group: 2685

Examiner: Not Yet Known

Our File: COG-2-0977.02.US

Date: September 15, 2006

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
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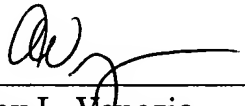
Further to Applicants' Duty of Disclosure pursuant to 37 C.F.R. §1.56, Applicants wish to bring to the Examiner's attention the material cited on the enclosed PTO-1449 form. Newly cited documents are indicated by an asterisk (*). Copies of the cited documents are enclosed.

Applicant: Sugar et al.
Application No.: 10/707,744

It is respectfully requested that the Examiner consider these documents and return an initialed copy of the PTO-1449 form indicating his consideration of the cited materials.

Respectfully submitted,

Sugar et al.

By 
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ALV/akg
Enclosures (12)



FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				ATTY. DOCKET NO. COG-2-0977.02.US		SERIAL NO. 10/707,744	
				APPLICANT Sugar et al.			
				FILING DATE January 8, 2004		GROUP 2685	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		4,150,344	04/1979	Fenk			
		4,263,676	04/1981	Liebel			
		4,310,809	01/1982	Buck et al.			
		4,580,289	04/1986	Enderby			
		4,696,055	09/1987	Marshall			
		4,905,306	02/1990	Anderson			
		5,150,085	09/1992	Hales			
		5,220,688	06/1993	Tao			
		5,548,825	08/1996	Maemura et al.			
		5,579,341	11/1996	Smith et al.			
		5,606,736	02/1997	Hasler et al.			
		5,715,529	02/1998	Kianush et al.			
		5,752,169	05/1998	Hareyama et al.			
		5,758,265	05/1998	Okanobu			
		5,832,375	11/1998	Leisten et al.			
		5,859,854	01/1999	Reudink			
		5,878,332	03/1999	Wang et al.			
		5,966,666	10/1999	Yamaguchi et al.			
		5,974,306	10/1999	Hornak et al.			
		6,094,084	07/2000	Abou-Allam et al.			
		6,097,269	08/2000	Hernandez			
		6,125,266	09/2000	Matero et al.			
		6,151,354	11/2000	Abbey			
		6,157,822	12/2000	Bastini et al.			
		6,215,988	04/2001	Matero			
		6,239,645	05/2001	Tsukahara et al.			

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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,252,548	06/2001	Jeon			
		6,259,895	07/2001	Yoshikawa et al.			
		6,282,413	08/2001	Baltus			
		6,285,720	09/2001	Martone			
		6,351,502	02/2002	Zargari			
		6,359,923	03/2002	Agee et al.			
		6,377,631	04/2002	Raleigh			
		6,381,471	06/1999	Dvorkin			
		6,456,833	11/1999	Sessink			
		6,473,467	10/2002	Wallace et al.			
		6,477,148	11/2002	Gardenfors et al.			
		6,529,719	03/2003	Imbornone et al.			
		6,542,724	04/2003	Copeland et al.			
		6,549,096	04/2003	Groves et al.			
		6,553,216	04/2003	Pugel et al.			
		6,766,149	07/2004	Hikita et al.			
		6,771,706	08/2004	Ling et al.			
		6,778,612	08/2004	Lozano et al.			
		6,888,809	05/2005	Foschini et al.			
		2001/0011013	08/2001	Vorenkamp et al.			
		2001/0015994	08/2001	Nam			
		2001/0036818	11/2001	Dobrovolny			
		2002/0077070	06/2002	McNamara et al.			
		2002/0111142	08/2002	Klimovitch			
		2002/0150173	10/2002	Buda			
		2002/0164963	11/2002	Tehrani et al.			

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		2002/0165626	11/2002	Hammons, Jr. et al.			
		2002/0173337	12/2002	Hajimiri et al.			
		2002/0177447	11/2002	Walton et al.			
		2003/0002604	01/2003	Fifield et al.			
		2003/0035491	02/2003	Walton et al.			
		2003/0076797	04/2003	Lozano			
		2003/0076908	04/2003	Huang et al.			
		2003/0185285	10/2003	Talwar			
		2003/0207668	11/2003	McFarland et al.			
		2003/0223391	12/2003	Malaender et al.			
		2003/0224750	12/2003	Sampath			
		2004/0017847	01/2004	Alberth, Jr. et al.			
		2004/0204036	10/2004	Yang			
		2004/0234012	11/2004	Rooyen			
		2004/0252632	12/2004	Bourdoux et al.			
		2005/0009476	01/2005	Wu et al.			
		2005/0020298	01/2005	Masumoto et al.			
		2005/0042997	02/2005	Steele et al.			
		2005/0047384	03/2005	Wax et al.			
		2005/0123025	06/2005	Sorrells et al.			

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				APPLICANT Sugar et al.				
				FILING DATE January 8, 2004		GROUP 2685		
FOREIGN PATENT DOCUMENTS								
		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
		03/092997	11/2003	WO				
		0 823 790	02/1998	EP				
		1 207 645	05/2002	EP				
		1 387 501	02/2004	EP				
		1 569 362	08/2005	EP				
		H11-46113	02/1999	JP			X**	
		2000-188522	07/2000	JP			X**	
		2001-024569	01/2001	JP			X**	
		2001-285114	10/2001	JP			X**	
		2002-26462	01/2002	JP			X**	
		2003-244045	08/2003	JP			X**	
		2003-283359	10/2003	JP			X**	
		2003-060604	02/2003	JP			X**	
		2004-179822	06/2004	JP			X**	
		2004-336561	11/2004	JP				
		2003-0058265	07/2003	KR				X
		2005-0013011	02/2005	KR				X

** Abstract Only

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		APPLICANT Sugar et al.	
		FILING DATE January 8, 2004	GROUP 2685
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
		"Fodus Delivers 802.11B/G and 802.11B/A/G WLAN Total Solutions", http://www.fodus.com/DOCS/2003-09-15%20Fodus%20Press%20Release.htm , September 15, 2003.	
		"Parkervision Announces Successful Development of Most Integrated High Performance Wireless LAN Transceiver Chips Current Available", July 30, 2002.	
		"Single Chip Bluetooth Radio Transceiver", STMicroelectronics, 2001, (2 pages).	
		Behbahani et al., "An All CMOS, 2.4 GHz, Full Adaptive, Scalable, Frequency Hopped Transceiver", University of California, Los Angeles, Integrated Circuits & Systems Laboratory, date unknown.	
	*	Bouras et al. "A Digitally Calibrated 5.15-5.825GHz Transceiver for 802.11a Wireless LANs in 0.18µm CMOS." 2003 IEEE International Solid-State Circuits Conference.	
		Brodersen, "BWRC Status", Summer 2002 Retreat Presentations, Berkeley Wireless Research Center, June 3, 2002.	
	*	Brodersen et al. "Wireless Systems-On-a-Chip Design." IEEE, 2001, pp. 45-48.	
	*	Cabric et al. "On MIMO Signal Processing for Adaptive W-CDMA and OFDM Wireless Transceivers." IEEE 2005.	
		Cabric et al., "RF Front-End for MCMA Systems", Summer 2002 Retreat Presentations, Berkeley Wireless Research Center, June 3, 2002.	
		Cho et al., "Multi-Standard Monolithic CMOS RF Transceiver", University of California, Berkeley, January 8, 1996, (1-26).	
		Clarke, "Chip Set Bridges 802.11a and .11b Wireless LANs", EETimes.com, http://www.eetimes.com/showArticle.jhtml?articleID=10809297 , September 24, 2001.	
		Copeland et al., "5GHz SiGe HBT Monolithic Radio Transceiver with Tunable Filtering", IEEE Trans. On Microwave Theory and Techniques, February 2000, Vol. 48, No. 2.	
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		Ellingson et al., "An 8-Element Dual-Frequency Array Receiver for Propagation Measurements Near 2.4 GHz", The Ohio State University ElectroScience Laboratory, July 2001.	
		Gozali et al., "Virginia Tech Space-Time Advanced Radio (VT-STAR)", Proceedings, Radio and Wireless Conference (RAWCON), 2001.	
		Lantz, "A 5GHz, SiGe, Monolithic WLAN Transceiver", PCC Workshop, 1999.	
		Long, "A Low Voltage 5.1-5.8 GHz Image-Reject Downconverter RF IC", IEEE Journal of Solid State Circuits, Vol. 35, No. 9, September 2000, pp. 1320-1328.	
		Macedo et al., "A 1.9-GHz Silicon Receiver with Monolithic Image Filtering", IEEE Journal of Solid-State Circuits, Vol. 33, No. 3, March 1998, pp., 378-386.	
		Madhian et al., "A 5 GHz-Band Multifunctional BiCMOS Transceiver Chip for GMSK Modulation Wireless Systems," IEEE Journal of Solid-State Circuits, Vol. 34, No. 1, January 1999.	
		Nikolic, "From Algorithms to Systems-on-a-Chip in a Semester", BWRC Winter 2001 Retreat, Berkeley Wireless Research Center, January 8, 2001.	
	*	Poon et al. "Degrees of Freedom in Multiple-Antenna Channels: A Signal Space Approach." IEEE Transactions on Information Theory, Vol. 51, No. 2, February 2005, pp. 523-536.	
	*	Poon et al. "An Adaptive Multiantenna Transceiver for Slowly Flat Fading Channels." IEEE Transactions on Communications, Vol. 51, No. 11, November 2003, pp. 1820-1827.	
	*	Poon et al. "Indoor Multiple-Antenna Channel Characterization From 2 to 8 GHz." IEEE 2003, pp. 3519-3523.	
	*	Poon et al. "The Signal Dimensions in Multiple-Antenna Channels." IEEE 2003, pp. 1247-1251.	
	*	Poon et al. "Multiple-Antenna Channels From a Combined Physical and Networking Perspective." IEEE 2002, pp. 1528-1532.	
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	*	Poon et al. "A Spatial Channel Model for Multiple-Antenna Systems." IEEE 2004, pp. 3665-3668.	
		PV-1000Hb 802.11b RF Transceiver Product Specification, 2002, pp. 1-11.	
		Rudell et al., "Highly Integrated Transceiver Architectures for Adaptive RF Communications", University of California, Berkeley, date unknown.	
		Rudell et al., "Recent Developments in High Integration Multi-Standard CMOS Transceivers for Personal Communication Systems", 1998 International Symposium on Lower Power Electronics, Monterey, California.	
		Rudell et al., "Second Generation Multi-Standard Monolithic CMOS RF Transceiver", University of California, Berkeley, June 16, 1996.	
	*	Vassiliou et al. "A Single-Chip Digitally Calibrated 5.15-5.825-GHz 0.18 μ m CMOS Transceiver for 802.11a Wireless LAN." IEEE Journal of Solid-State Circuits, Vol. 38, No. 12, December 2003, pp. 2221-2231.	
	*	Zhang et al. "A Low-Complexity Antenna Diversity Receiver Suitable for TDMA Handset Implementation." IEEE 1997, pp. 1753-1757.	

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Atty. Docket # COG-2-0977.02.US
Mailed prepaid on: September 15, 2006
by [X] First Class or [] Express Mail to: Mail
Stop Amendment, Commissioner for Patents, P.O.
Box 1450, Alexandria, VA 22313-1450

IN RE PATENT APPLICATION OF

Inventors: Sugar et al.
Appln. No.: 10/707,744
Filed: January 8, 2004
Title: MULTIPLE-INPUT MULTIPLE-
OUTPUT RADIO TRANSCEIVER

Kindly acknowledge receipt of the following items with respect to the
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